Environmental Laboratory
WASHINGTON REPORT

ROUTE TO:

Federal News, Industry Developments and Practical Strategies for Successful Lab Management

VOLUME 13, ISSUE 6 MARCH 28, 2002

Federal news

USGS study finds pharmaceutical pollutants in U.S. waters

A recently published government study reveals that the country's waterways are being polluted with chemicals that are mostly unregulated and are not usually removed at wastewater treatment plants.

The chemicals, known collectively as pharmaceutical and personal care pollutants, are common substances found in a myriad of household items, such as painkillers, insect repellents, detergents, contraceptives and personal cleansing products.

Hydrologists with the **U.S. Geological Survey** collected water samples from over 100 waterbodies in 30 states. The samples were analyzed for 95 different compounds. The results showed that these chemicals persist in the environment in very low concentrations — as low as one part per billion or less — but they may be having a cumulative impact on environmental health and safety.

The study results were published in a March issue of *Environmental Science and Technology*.

The use and disposal of 81 of the 95 chemicals studied go completely unregulated, and most wastewater treatment operations do not completely remove these substances before discharging into U.S. waters, the study said. But the environmental and health risks posed by exposure to these chemicals are not fully understood. Scientists believe there is a link between some of these substances, such as antibacterial agents in human medicines, that could potentially impact the environment on a broad scale.

(See **POLLUTANTS** on page 4)

Industry news

Software suite offers flexibility, ease of use for lab applications

Environmental Information Systems Corp., a Las Vegas-based software firm, has expanded its flagship software product for analytical data reporting.

The company has developed a new add-on application module that will generate reports and review data for pesticides and PCBs. That complements modules already on the market that review and generate data reports for the analysis of metals, general chemistry, volatile organic compounds and semivolatiles. Together, the five modules comprise EISC's Analytical Review and Reporting software suite.

(See **SOFTWARE** on page 8)

Inside

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POLLUTANTS (continued from page 1)

Antibacterial agents could in fact be encouraging the development of germs that are resistant to antibiotics, some scientists say.

And previous studies have linked the presence of hormones originating in human birth control compounds and dietary supplements to deformed sexual organ development in some wildlife, as well as sex reversal in certain fish species.

The USGS found seven or more of these chemicals in half of all rivers and streams it surveyed.

The most frequently detected compounds were coprostanol and cholesterol — both by-products of digestion — and caffeine. The scientists also found many samples containing the insect repellent compound DEET.

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>
> —Christian Daughton
> EPA

Exposure to even minute amounts of some of these substances could impact wildlife over time, according to **Christian Daughton** of the **EPA**'s National Exposure Research Laboratory. Daughton believes much more extensive research is needed to fully identify how these chemicals are interacting to adversely impact wildlife and the public.

"The bulk of research has traditionally gone towards studying conventional pollutants," Daughton told *ELWR*, "but those contaminants are only a small portion of the vast number of chemicals that persist in the environment."

Daughton said the USGS study should raise some eyebrows among the regulatory community because it shows just how prevalent these unregulated contaminants really are.

As for future regulation of PPCPs, he said the first step would likely be to add one or more of the substances to the EPA's Contaminant Candidate List. If that happens, wastewater treatment plants would be required to screen for these substances. If such screening shows routine detection of contaminants, the EPA may choose to regulate them in some way.

Nationwide monitoring system needed

In Daughton's opinion, a nationwide screening system for some of these contaminants should be implemented because of the potential research benefits.

Some of the chemicals could be tracked as "indicators" for different problems. For example, a chemical that is detected in rivers or streams might indicate the presence of sewage contamination, much in the same way as coliform bacteria is tracked to determine sewage contamination.

Tracking the presence of pharmaceuticals or illicit drugs in the environment could be an effective analytical tool for tracking consumption habits in a particular area, according to Daughton.

And monitoring for new and emerging chemicals could help researchers studying drug use by identifying early on when a new drug has hit the streets, Daughton said. Such early detection could help in stemming the spread of new drugs, he said.

"If we had a monitoring system in place for detecting emerging chemicals in the environment, we'd be able to pick these things up before they become a fad," Daughton said.

Cross-discipline approach needed

The environmental dangers posed by PPCPs are little understood for the most part, Daughton said. That's because in order to study and understand the interaction between the many different chemical compounds — pharmaceuticals, hormones, antibiotics and conventional chemicals like the insect repellent DEET — researchers must be proficient in many different fields of science.

However, most scientists specialize in just one or two fields, and don't keep up with developments in other fields.

For example, pharmaceutical scientists are probably the best candidates for evaluating the impact of drugs on the environment. But without the knowledge of an environmental chemist, they may not be able to fully outline how that impact might be affected by the presence of other non-pharmacological pollutants like household insecticides.

Daughton said a bridge must be built between the knowledge bases of the pharmaceutical and environmental sciences to fully understand how all these different and pervasive chemicals interact in the natural world. ❑

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